

REMARKS

This is in response to the non-final Official Action currently outstanding with regard to the present application.

Claims 1-16 were pending in this application at the time of the issuance of the currently outstanding Official Action. By the foregoing Amendment, the Title of the Invention has been amended and a request for drawing change approval has been presented, but no Claims have been amended, canceled, added or withdrawn. Accordingly, upon the entry of the foregoing amendment, Claims 1-16 as originally filed will constitute the Claims under active prosecution in this application.

Claims 1-16 as originally filed are reproduced above solely for convenience of reference in satisfaction of the spirit of the Rules.

More particularly, in the currently outstanding Official Action the Examiner has:

1. Acknowledged Applicants' claim for foreign priority under 35 USC §119 (a)-(d) or (f), and confirmed the receipt of the required copies of the priority documents by the United States Patent and Trademark Office;
2. Provided the Applicants with objections to the drawings as filed with this application on 19 January 2001 wherein it is specified that Figures 7-9 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP §608.02(g).
Applicant hereinabove has requested approval of the addition of the legend -- CONVENTIONAL ART -- to Figs. 7-9, and concurrently herewith has submitted new formal drawing for this application incorporating that change. Acceptance of the new formal drawings filed concurrently herewith in response to this communication is respectfully requested;

3. Acknowledged her consideration of the Information Disclosure Statements filed in this application on 19 January 2001 and 14 May 2003 respectively, by providing the Applicants with a copy of the Forms PTO-1449 that accompanied those Statements duly signed, dated and initialed to confirm the consideration of the art listed therein;
4. Objected to the Title of the Invention as not being adequately descriptive of the invention to which the claims are directed – **By the foregoing Amendment, Applicant has deleted the present Title of the Invention and proposed a new Title of the Invention that is believed to overcome the Examiner's objection. Entry of the above new Title of the Invention into this application and withdrawal of the outstanding objection to the Title of the Invention in response to this communication, therefore, are respectfully requested;**
5. Rejected Claim 1-5, 7, 9-13, and 15 under 35 USC §103(a) as being unpatentable over the Applicant's admitted prior art in view of Lambeth (US patent 4,512,106);
6. Rejected Claims 8 and 16 under 35 USC §103(a) as being unpatentable over the Applicant's admitted prior art in view of Lambeth as applied to Claim 1, further in view of Fossum et al. (US Patent Application Publication 2003/0193597); and
7. Indicated that Claims 6 and 14 are objected to as being dependent upon a rejected base claim, but that those claims would be allowable if rewritten in independent form including all of the limitations of their respective base claims and any intervening claims.

No further comment regarding items 1-4 and 7 above is deemed to be required in these Remarks.

With respect to items 5 and 6, Applicant respectfully traverses the Examiner's currently outstanding substantive rejections of the claims of this application as originally filed, and requests reconsideration in response to this communication for the following reasons.

In support of the foregoing traverse of the Examiner's outstanding substantive rejections of the claims of this application as filed, Applicant respectfully submits (1) that the means by which the present invention and the art relied upon by the Examiner achieve improvement in the signal-to-noise ratio are distinct and different from one another, and (2) that in any case, the Examiner has resorted to improper hindsight reasoning in the course of her rejections of the claims of this application as originally filed.

With respect to the first of these points, Applicant notes that the Examiner alleges that the so-called "Applicant's admitted prior art" discloses all of the features of Claim 1 of this application except for the limitation regarding the changing of the potential of the drain from a HIGH state, to a LOW state, to a HIGH state while keeping both the transfer gate and the reset gate ON. Further, the Examiner argues that the method of improving the signal-to-noise ratio disclosed and claimed in the present application is disclosed by the Lambeth reference such that it would have been obvious to a person of ordinary skill in the art at the time that the present invention was made to combine the Lambeth reference with the so-called "Applicant's admitted prior art" so as to reach the present invention. Applicant cannot agree.

Specifically, Applicant respectfully submits that the means utilized for achieving the improvement in signal-to-noise ratio provided by the present invention constitutes a different physical layout of components than the so-called "Applicant's admitted prior art", the Lambeth reference or any justifiable combination thereof. Hence, it will be understood that the Lambeth reference describes a photosensor array connected to a CCD shift register by a transfer gate. This is to be contrasted with the present invention that is an Active Pixel Sensor device wherein each sensor has its own transfer gate. Furthermore, the present invention is an amplification type imager while the Lambeth device clearly is not an amplification-type solid state imaging device or even a device comparable to an amplification-type solid state imaging device.

Thus, it will be seen that in Lambeth, a drain to which an adjustable bias voltage is applied is provided between each of the photosensors and an associated transfer gate. Accordingly, the Lambeth reference is not an amplification-type solid imaging device or comparable to an amplification-type solid imaging device as herein disclosed and claimed. Instead, the Lambeth reference utilizes the so-called spill and fill technique referred to by the Examiner (see Lambeth at Column 9, lines 2-21) wherein the photosensors are initialized via the application of a transfer pulse having a level slightly different from a transfer pulse that would be utilized in the transfer of charge from the photosensor to the CCD. This initializing transfer pulse lowers the transfer gate sufficiently to allow charge to flow into (i.e., fill) the photosensor when the bias voltage on the drain is momentarily changed and allows excess charge to spill back out of the photosensor over the lowered transfer gate when the bias voltage is returned to its normal level. This clearly is not the same as the presently claimed transistor switching, nor does it teach, disclose or suggest the same. Indeed, there is no spill back of charge supplied to the photosensor in the present invention at all.

In this regard, it will be understood that the present invention consists of a drain to which a variable voltage is applied, **to which a reset gate transistor is connected, which in turn is connected to a transfer gate**, the source of which is connected to the cathode of a photodiode. Accordingly, in the present invention, provision must be made to have both the reset gate and the transfer gate ON at the period t_5 so that charge can flow to the photodiode. The Lambeth reference, on the other hand, at Column 3, lines 62-67, describes a drain **to which only a transfer gate is connected**, to which the photosensor array is connected as discussed briefly above.

In addition, at Column 9, line 3, of the Lambeth reference, attention is drawn to Figs. 4 and 8. Those figures are significant because they are the only drawings of the Lambeth reference that deal with the techniques that the Examiner desires to combine with so-called "Applicant's admitted prior art" in order to establish a basis for the rejection of the present claims of this application. Therefore, it is to be noted that Fig. 4 of the Lambeth reference illustrates a technique related to potential barrier variations in the transfer gate (see discussion above), not to a teaching, disclosure or suggestion of the present invention.

Further, Fig. 8 of Lambeth is illustrative of only the potential variations in the device therein disclosed in terms of time. **No diagram is provided that illustrates the correct physical layout of components required to achieve the desired effect in Lambeth.**

Consequently, Applicant respectfully submits that one skilled in the art would be lead by Lambeth's comment that "the drain is forward biased to fill the photodetectors with charge" that the photosensors in the Lambeth reference are to be arranged in such a manner with respect to the transfer gate as to be initialized under forward bias conditions. The result of this, however, is that one of ordinary skill in the art is left to design his own component layout without any definitive guidance from the specification of the Lambeth reference in order to achieve the Lambeth objective in the Lambeth context. In other words, as the Examiner herself has admitted, in order to combine the Lambeth reference with the so-called "Applicant's admitted prior art", one of ordinary skill in the art could not simply substitute Lambeth's circuitry into the structure shown by the so-called "Applicant's admitted art". Instead, one skilled in the art would be compelled in the course of any attempt to combine the Lambeth reference and the so-called "Applicant's admitted prior art" to develop the circuit shown in Fig. 7 of the present application so as to (i) bias the photoelectric conversion section by changing the potential on the drain, and (ii) change the state of the reset gate transistor and the transfer gate transistor to the ON state so as to allow charge transfer.

Therefore, the means used by the Lambeth reference to achieve the effect of improving signal-to-noise ratio cannot be applied to the so-called "Applicant's admitted prior art" without the addition of an inventive step thereto, i.e., the teachings of the Lambeth reference cannot be combined with the so-called "Applicant's admitted prior art" without modifications of those references that are nowhere disclosed, taught or suggested anywhere in either the Lambeth reference, the so-called "Applicant's admitted prior art" or anywhere else in the prior art known to Applicant or to which Applicant's attention has been directed by the Examiner. Consequently, Applicant respectfully submits that the Examiner has failed to establish the required *prima facie* case in support of her rejections under 35 USC 103(a) in this application.

In the latter regard, it will be recalled that in order to establish a *prima facie* case in support of a rejection under 35 USC 103 the Examiner must satisfy the following criteria:

To establish a *prima facie* case of obviousness under Section 103, Title 35 United States Code (35 US §103), three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. *Finally, the prior art reference (or references when combined) must teach or suggest all of the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure.* *In re Vaeck*, 947 F.2d 488, 20 USPQ2D 1438 (Fed. Cir. 1991). (See, Manual of Patent Examining Procedure §2142 (8th Edition), at page 2100-2121, *et seq.*) Emphasis added.

Applicant respectfully submits that the Examiner has not established the requisite *prima facie* case in support of her outstanding rejections under 35 USC 103 in the currently outstanding Official Action.

In this regard, Applicant further respectfully submits that the Examiner has totally failed to demonstrate the requisite motivation in the art for the combination of the Lambeth reference and the so-called “Applicant’s admitted prior art” at the time that the present invention was made upon which she relies. The reason for this is that the Lambeth reference refers to the utilization of its technique of signal-to-noise ratio reduction in relation to CCD design. It is to be understood, however, that the use of the Lambeth technique in CMOS type sensor technology would have been counterintuitive to those skilled in the art at the time that the present invention was made). This is primarily because CMOS circuitry generally is not found in CCD designs. There are specific design considerations that have to be taken into account when one incorporates any feature into a CMOS sensor. Hence, the adaptation of an existing CMOS framework to perform a new function is itself novel and innovative. It therefore would involve more than a simple combination of an existing CCD circuit with an existing CMOS circuit as the Examiner’s currently outstanding rejections suggest.

Accordingly, Applicant respectfully submits that a simple combination of Lambeth’s component layout with an existing CMOS based background art would not have been possible at the time that the present invention was made. Instead, the existing CMOS framework would have to have been adapted in order to receive (i.e., be combined with) the Lambeth CCD technology, with the result being that absent improper resort to the present specification one skilled in the art would not at the time that the present invention was made have considered the Lambeth technology to be applicable to CMOS technology, or for that matter to be adaptable thereto.

Therefore, Applicant respectfully submits that not only were the Lambeth and so-called “Applicant’s admitted prior art” not directly combinable without significant and nonobvious modification at the time that the present invention was made, but also that nothing within the “four corners” of the prior art at the time that the present invention was made would have suggested or motivated one of ordinary skill in the art to attempt to make the combination relied upon by the Examiner in support of her currently outstanding rejections under 35 USC 103. In this state of the case, Applicant respectfully submits that the Examiner’s currently outstanding substantive claim rejections should be withdrawn, the claims as originally filed should be reconsidered, and this application should be allowed in response to this communication. An early decision so holding is respectfully requested.

Applicant also believes that additional fees beyond those submitted herewith are not required in connection with the consideration of this response to the currently outstanding Official Action. However, if for any reason a fee is required, a fee paid is inadequate or credit is owed for any excess fee paid, you are hereby authorized and requested to charge and/or credit Deposit Account No. 04-1105, as necessary, for the correct payment of all fees which may be due in connection with the filing and consideration of this communication.

Respectfully submitted,

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SIGNATURE OF PRACTITIONER

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